

### ABSTRACT

A method of forming a capacitor with reduced leakage current on a substrate in a semiconductor device is set forth. A first layer of a conductive material is formed over the substrate, and a second layer of a dielectric is formed over the first layer.

- 5 The second layer is contacted with hydrogen, oxygen and nitrous oxide gases to form an oxidation layer over the second layer. A third layer of a conductive material is formed over the second layer to thereby form the capacitor. While the capacitor exhibits an improved leakage current reduction, overall capacitance is substantially unaffected, as compared to a similar capacitor having an oxidation layer built from a combination of
- 10 oxygen and hydrogen gases only.